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ABSTRACT

Verbal analogy items, consisting of an ambiguous stimulus word pair and two unambiguous response word pairs as choice alternatives, were presented to psychology students in a counterbalanced design to discover if preferences existed between the two competing relations in each item. The data were analyzed to see if these preferences ordered themselves into a hierarchy. With only half of a full paired-comparisons matrix available for study, the data suggest that a hierarchical ordering of preferences for relations exists, with the cause-effect relation deduced most readily and the order-time relation least readily. The results also suggest a need for developmental research into the origins of these preferences and investigation of the role of both individual differences and cultural differences. (Author/LL)

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Technical Report No. 8

THE HIERARCHICAL ORDERING OF PREFERENCE FOR
RELATIONS IN SOLVING VERBAL ANALOGY ITEMS

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The Hierarchical Ordering of Preferences
for Relations in Solving Verbal Analogy Items

Eileen Q. Monson and Rene' V. Dawis

In previous technical reports in this series, it has been shown that type of relation and relation education frequency are important variables influencing the difficulty of verbal analogy items. The Relation Education Index (REI) was developed as a measure of the frequency with which a given logical relation is educated in a given word pair. In developing REI norms, it was found that REIs differed from word pair to word pair for given relations, and from relation to relation for given word pairs. It was also found that the same word pair could have equivalent REIs for two or more relations.

If two relations are both available to be educated at the same high strength, is there a preference for one over the other? Would such preferences, if they exist, order themselves into a hierarchy? These questions were among those raised by the data on REI norms. The present report is about a study conducted to investigate these two questions.

Method

Instrumentation

Using the REI norms for college students (Technical Report No. 4; Soriano, Dawis, & Siojo, 1974) verbal analogy items were constructed, consisting of an "ambiguous" word pair as the stimulus and two "unambiguous" word pairs as the response alternatives. "Ambiguous" word pairs, i.e., with two highly educible relations, were selected according to the following rules:

- (1) The word pair must have only two relations with REIs of 70 or higher.
- (2) The two relations should not differ in REI value by more than five points.
- (3) The two relations should have REI values higher than all other relations by at least 20 points.

"Unambiguous" word pairs were selected to meet the following rules:

- (1) The word pair must have only one relation with an REI of 70 or higher.
- (2) This relation should have an REI value higher than all other relations by at least 20 points.

Thus, an analogy item could be constructed with an ambiguous word pair as the stimulus pair, and two unambiguous word pairs (one for each of the stimulus-pair's highly educible relations) as the response pairs (alternatives). One additional rule was needed: The two unambiguous word pairs chosen for the same item should not differ in REI value for their most highly educible relation by more than 10 points. (A more stringent criterion of five points was set originally, but only a few items could be constructed which met this criterion.) Furthermore, stimulus and response word pairs were matched as closely as possible in REI value for the relations of concern (the most highly educible relations).

The items were put together in an instrument called the Relation Recognition Exercise. Two forms, A and B, of the Exercise were constructed with different item order and with the order of the two response word pairs for each item reversed on the second form. The Exercise booklet, shown in the Appendix, contained a cover page, biographical information sheet, instructions, and 68 items.

Table 1 shows the number of items written for each pairing of relations. As Table 1 shows, it was easier to write items for some pairings than for others, and items could not be written for half of the possible pairings.

The eight relations used in the Relation Recognition Exercise were:

- (1) Class-member--when one member of the pair includes the other or is a member of the other.
- (2) Extrinsic Functional--when both members in the pair perform the same activity or have the same use.
- (3) Intrinsic Functional--when one member of the pair performs some activity on or for the other.

Table 1
Number of Verbal Analogy Items
Written for Each Pairing of Relations

First Relation	Second Relation ^a						
	2	3	4	5	6	7	8
1. Class-Member	3	11	2	12	5	--	1
2. Extrinsic Functional		1	17	1	--	--	1
3. Intrinsic Functional			--	--	--	1	--
4. Similarity/Equivalence				--	--	--	--
5. Conversion/Process					2	--	--
6. Order/Time						6	3
7. Opposite							--
8. Cause-Effect							

Note. Two items were dropped (see text), to leave a total of 66 items.

^aSame relation as designated under "First Relation."

- (4) Similarity/Equivalence--when both members of the pair are similar or equivalent.
- (5) Conversion/Process--when one member of the pair is converted or processed from the other.
- (6) Order/Time--when both members of the pair follow one another in a certain order or in time.
- (7) Opposite--when the two members of the pair are opposites to each other.
- (8) Cause-Effect--when one member of the pair is a cause of the other (the other is an effect of the first).

Subjects

The subjects for this study were college students from an introductory psychology course. The majority of students were middle to upper class, white, freshmen or sophomores, and included roughly equal numbers of males and females. Each subject volunteered for the study in exchange for two points toward the final course grade. A total of 71 individuals completed the Relation Recognition Exercise, with 35 taking Form A and 36, Form B.

Data Collection Procedure

The subjects were given alternative blocks of time during which they could report for the study. Subjects reported usually alone or in small groups of two or three. Upon reporting, the subjects were told about the study (which was described to them as a "relation recognition exercise"), and they were given the test booklets. The subjects first filled out the biographical information sheet (see Appendix for a copy). Then they read the directions silently and proceeded to complete the Exercise. No time limits were given for completion of the Exercise.

Data Analysis

Two items were eliminated from the study. One of them was found to be

reproduced incorrectly on Form B. A recheck had earlier shown that the two items failed to meet the criteria for item construction discussed above.

To check for response set, the influence of order of presentation of the response alternatives was analyzed by comparing response distributions on the two forms. This analysis was done first, before proceeding with other analyses.

The main data analyses were directed at the two research hypotheses:

(a) whether, for a given item, there was a difference in choice of alternative, i.e., in preference for one relation over the other in the education of relations; and (b) if such differences existed, whether the relations were ordered in these preferences in a recognizable hierarchy. For the first hypothesis, the significance of the observed deviation from a 50-50 response distribution, expected under the null hypothesis, was tested. This was done for each item from each form and from both forms combined. For the second hypothesis, the results of the preceding analysis were summarized in an incomplete paired comparisons matrix, pairing each relation with every other relation, and a ratio was calculated of the number of times a given relation was preferred to the number of pairings for the given relation. Furthermore, the proportion of preferences (frequency of preference over total number of pairings across all subjects) for each relation was cumulated for the total data set to see if a hierarchy emerged.

Results

Table 2 shows the distribution of responses across all items in each form of the Relation Recognition Exercise. It will be recalled that order of presentation for the response alternatives was reversed for Form B, i.e., response alternative a for each item on Form A was response alternative b on the same item on Form B. A visual inspection of Table 2 shows an almost identical proportion of choices for the same response alternative regardless of position. It was therefore concluded that response set (i.e., a position preference) did not influence the results of the study to any significant degree.

Table 2
 Distribution of Response Choices Across All Items
 of the Relation Recognition Exercise, by Form

Response Alternative	Form					
	A		B		Combined	
	N	%	N	%	N	%
a	1,091	47.23	1,225	51.56	2,316	49.42
b	1,172	50.72	1,131	47.60	2,303	49.15
No response	47	2.03	20	0.84	67	1.43

Note. Response alternative a in Form A is response alternative b in Form B and vice versa.

Table 3
Distribution of Response Choices to
the Relation Recognition Exercise,
by Item and Form

Relation ^a Pairing	Form A			Form B			Combined	
	Item	% Choosing		Item	% Choosing		% Choosing	
	No.	P ^b	Q ^b	No.	P	Q	P	Q
Relation 1 (P) ^b								
vs. 2 (Q) ^b	46	71.4	28.6	63	41.7	55.6 ^c	56.3	42.3
	55	20.0	77.2	46	36.1	63.9	28.2	70.4**
	56	5.7	91.4	44	16.7	83.3	11.3	87.3**
	All ^d	32.4	65.7	All	31.5	67.6	31.9	66.7**
Relation 1 (P)								
vs. 3 (Q)	2	68.6	31.4	10	36.1	63.9	52.1	47.9
	5	2.9	97.1	54	5.6	94.4	4.2	95.8**
	6	51.4	48.6	5	50.0	50.0	50.7	49.3
	12	0.0	97.1	60	8.3	88.9	4.2	93.0**
	15	65.7	31.4	20	63.9	33.3	64.8	32.4**
	30	11.4	85.7	67	16.7	80.6	14.1	83.1**
	39	40.0	60.0	32	27.8	72.2	33.8	66.2**
	45	94.3	5.7	37	88.9	11.1	91.6	8.5**
	49	68.6	31.4	19	69.4	30.6	69.0	31.0**
	50	51.4	48.6	58	47.2	50.0	49.3	49.3
	63	34.3	62.9	33	38.9	61.1	36.6	63.0*
	All	44.4	54.6	All	41.2	57.8	42.8	56.2**

(continued)

Table 3 continued

Relation ^a Pairing	Form A			Form B			Combined	
	Item	% Choosing		Item	% Choosing		% Choosing	
	No.	P ^b	Q ^b	No.	P	Q	P	Q
Relation 1 (P)								
vs. 4 (Q)	37	80.0	17.1	66	80.6	16.7	80.3	16.9**
	67	37.1	57.1	3	41.7	58.3	39.4	57.8
	All	58.6	37.1		61.1	37.5	59.9	37.3*
Relation 1 (P)								
vs. 5 (Q)	18	74.3	22.9	8	58.3	41.7	66.2	32.4**
	22	51.4	45.7	17	63.9	33.3	57.8	39.4
	25	11.4	85.7	31	38.9	61.1	25.4	73.2**
	28	62.9	34.3	29	63.9	36.1	63.4	35.2*
	31	0.0	97.1	34	11.1	88.9	5.6	93.0**
	41	31.4	68.6	39	27.8	72.2	29.6	70.4**
	44	65.7	34.3	16	50.0	50.0	57.8	42.3
	48	74.3	25.7	61	52.8	41.7	63.4	33.8*
	52	40.0	60.0	13	38.9	61.1	39.4	60.6
	59	2.9	94.3	12	13.9	86.1	8.5	90.1**
	61	8.6	88.6	22	11.1	88.9	9.9	88.7**
	64	37.1	60.0	41	36.1	63.9	36.6	62.0*
	All	38.3	59.8	All	38.9	60.4	38.6	60.1**
Relation 1 (P)								
vs. 6 (Q)	13	74.3	22.9	45	69.4	30.6	71.8	26.8**
	16	48.6	48.6	68	33.3	63.9	40.9	56.3
	24	40.0	57.1	47	44.4	55.6	42.3	56.3
	33	20.0	77.1	30	27.8	72.2	23.9	74.7**
	47	97.1	2.9	40	91.7	8.3	94.4	5.6**
	All	56.0	41.7	All	53.3	46.1	54.7	43.9

(continued)

Table 3 continued

Relation ^a Pairing	Form A			Form B			Combined	
	Item	% Choosing		Item	% Choosing		% Choosing	
	No.	P ^b	Q ^b	No.	P	Q	P	Q
Relation 1 (P)								
vs. 8 (Q)	32	0.0	97.1	15	11.1	88.9	5.6	93.0**
Relation 2 (P)								
vs. 3 (Q)	51	20.0	80.0	9	27.8	72.2	23.9	76.1**
Relation 2 (P)								
vs. 4 (Q)	1	14.3	85.7	18	11.1	88.9	12.7	87.3**
	4	40.0	60.0	4	27.8	66.7	33.8	63.4**
	10	14.3	82.9	38	25.0	75.0	19.7	78.9**
	17	22.9	74.3	56	13.9	83.3	18.3	78.9**
	19	40.0	57.1	55	41.7	55.6	40.9	56.3
	20	20.0	77.1	48	33.3	66.7	26.8	71.8**
	26	34.3	62.9	36	33.3	66.7	33.8	64.9*
	27	42.9	54.3	64	55.6	41.7	49.3	47.9
	29	14.3	82.9	51	27.8	72.2	21.1	77.5**
	35	22.9	74.3	65	22.2	75.0	22.5	74.6**
	36	60.0	37.1	21	69.4	30.6	64.8	33.8*
	42	5.7	94.3	27	25.0	75.0	15.5	84.5**
	53	48.6	51.4	24	50.0	50.0	49.3	50.7
	54	51.4	48.6	49	38.9	61.1	45.1	54.9
	58	40.0	57.1	57	58.3	36.1	49.3	46.5
	60	37.1	57.1	43	69.4	30.6	53.5	43.7
	68	11.4	85.7	35	22.2	77.8	16.9	81.7**
	All	30.6	67.2	All	36.8	61.9	33.7	64.5**

(continued)

Table 3 continued

Relation ^a Pairing	Form A			Form B			Combined	
	Item	% Choosing		Item	% Choosing		% Choosing	
	No.	P ^b	Q ^b	No.	P	Q	P	Q
Relation 2 (P)								
vs. 5 (Q)	11	20.0	77.1	1	11.1	88.9	15.5	83.1**
Relation 2 (P)								
vs. 8 (Q)	62	31.4	65.7	26	27.8	72.2	29.6	69.0**
Relation 3 (P)								
vs. 7 (Q)	65	25.7	71.4	7	30.6	66.7	23.2	69.0**
Relation 5 (P)								
vs. 6 (Q)	8	80.0	17.1	59	80.6	16.7	80.3	16.9**
	9	42.9	54.3	11	47.2	52.8	45.1	53.5
	All	61.4	35.7	All	63.9	34.7	62.7	35.2**
Relation 6 (P)								
vs. 7 (Q)	14	51.4	45.7	23	41.7	58.3	46.5	52.1
	23	17.1	80.0	2	25.0	75.0	21.1	77.5**
	34	60.0	37.1	6	33.3	66.7	46.5	52.1
	38	37.1	60.0	50	25.0	75.0	31.0	67.6**
	40	54.3	45.7	42	52.8	47.2	53.5	46.5
	43	14.3	85.7	14	8.3	91.7	11.3	88.7**
	All	39.1	59.1	All	31.0	69.0	35.0	64.1**
Relation 6 (P)								
vs. 8 (Q)	21	5.7	91.4	28	13.9	86.1	9.9	88.7**
	57	20.0	77.1	53	16.7	83.3	18.3	80.3**
	66	17.1	80.0	52	13.9	86.1	15.5	83.1**
	All	14.3	82.9	All	14.8	85.2	14.6	84.0**

(continued)

Table 3 continued

^aThe relations are: 1. Class-Member; 2. Extrinsic Functional; 3. Intrinsic Functional; 4. Similarity/Equivalence; 5. Conversion/Process; 6. Order/Time; 7. Opposite; and 8. Cause-Effect.

^bP and Q designate the response alternatives as indicated in the relation pairing column.

^cSums may not total 100.0% due to nonresponse.

^dData for all items combined for particular pairing of relations.

* $P \leq .05$ that a 50-50 hypothesis is correct.

** $P \leq .01$ that a 50-50 hypothesis is correct.

Table 3 contains the distribution of response choices for each item, separately for each form and for the two forms combined. The data are grouped by each pairing of relations. Table 3 also gives the combined data for all items of a given relation pairing. Only the data for the last two columns--for the two forms combined--were tested for significant deviation from a 50-50 hypothesis.

Examination of Table 3 shows that for the most part (in 59 of the 66 items) the data for Form A and Form B are similar, i.e., the two sets of data agree in direction of choice (which relation appeared to be preferred). Data for the two forms also agree to a large extent on degree of choice (percentage making the choice). The average absolute difference between the two forms in percentage choosing the preferred relation was 8.6%, with the difference exceeding 20% in only six of the 66 items.

Table 3 also shows that in 46 of the 66 items, one relation was educed significantly more frequently than the other. When the data for all the items pertinent to a particular relation pairing were combined, a significant preference for one relation over the other was observed for all but one of the 14 relation pairings (the exception was 1. Class-Member vs. 6. Order/Time). The preference results for these combined data are summarized in Table 4.

Table 4 shows that Relations 5 and 8 were most preferred, with each being preferred three times out of three pairings; Relations 3 and 7 were next most preferred (two out of three pairings); Relation 1 was preferred 1.5 times; Relations 2 and 4 were preferred once each, and Relation 6 was preferred only .05 times.

A different way of estimating the hierarchy of preference might proceed as follows: Relation 8 is preferred over Relations 1, 2, and 6; but Relation 1 is preferred over Relation 4, so by the rule of transitivity, Relation 8 is preferred over Relation 4 as well. By applying this rule, we get:

Table 4
Preference Matrix for the Pairing of Relations
in the Relation Recognition Exercise

Relation	Relation							
	1	2	3	4	5	6	7	8
1. Class-Member		1 ^a	1	0	1	.05	--	1
2. Extrinsic Functional	0		1	1	1	--	--	1
3. Intrinsic Functional	0	0		--	--	--	1	--
4. Similarity/Equivalence	1	0	--		--	--	--	--
5. Conversion/Process	0	0	--	--		0	--	--
6. Order/Time	.05	--	--	--	1		1	1
7. Opposites	--	--	0	--	--	0		--
8. Cause-Effect	0	0	--	--	--	0	--	

^a1 = column relation is preferred

0 = column relation is not preferred

.05 = neither relation is preferred

-- = no pairing

$$8 > 1, 2, 6, 4$$

$$5 > 1, 2, 6, 4$$

$$7 > 3, 6, 1, 2, 4$$

$$3 > 1, 2, 4$$

$$1 > 4$$

$$4 > 2$$

$$2 > 1$$

$$1 = 6$$

We find that there are two groups of relations in terms of preferences: the preferred group consists of Relations 8, 5, 7, and 3, while the less preferred group consists of Relations 1, 2, 4, and 6.

Yet another way of estimating the hierarchy of preference is by summarizing the data in terms of the proportion of items in which a clear preference was exhibited for one relation over another. This summary is shown in Table 5. If the percentage of item preference were used as the index, the order of preference would be as follows:

$$8, 7, 4, 5, 3, 1, 2, 6$$

This ordering would be consistent with the rank order shown in preceding ways of looking at the hierarchy of preferences, except for the position of Relation 4 (which is ranked much higher here than in other estimates)

A final method of estimating the hierarchy of preference would be to sum the number of times (items x subjects) a relation was preferred and to take this sum as a proportion of the number of possible times it could have been preferred. Table 6 shows the results for this method. Again, the hierarchy of relation preference shown in Table 6 is consistent with previously derived hierarchies.

Table 5
Item Preference Matrix for the Pairing
of Relations in the Relation Recognition Exercise

Relation	Relation							
	1	2	3	4	5	6	7	8
1. Class-Member		2.5	6.5	0.5	7.5	2	--	1
2. Extrinsic Functional	0.5		1	13	1	--	--	1
3. Intrinsic Functional	4.5	0		--	--	--		--
4. Similarity/Equivalence	1.5	4	--		--	--	--	--
5. Conversion/Process	4.5	0	--	--		0.5	--	--
6. Order/Time	0	--	--	--	1.5		4.5	--
7. Opposite	--	--	0	--	--	1.5		3
8. Cause-Effect	0	0	--	--	--	0	--	
Total preferences	14.0	6.5	7.5	13.5	10.0	4.0	5.5	5
Number of item pairings	34	23	13	19	15	16	7	5
Preference percentage	41.2	28.3	57.7	71.0	66.7	25.0	78.6	100
Rank order	6	7	5	3	4	8	2	1

Table 6
Frequency of Preference for Relations
Across Items x Subjects

	N Preference	N Possible	% Preference
8. Cause-Effect	294	355	82.8
7. Opposite	322	497	64.8
5. Conversion/Process	660	1,065	62.0
4. Similarity/Equivalence	832	1,349	61.7
3. Intrinsic Functional	513	923	55.6
1. Class-Member	1,014	2,414	42.0
2. Extrinsic Functional	598	1,633	36.6
6. Order/Time	421	1,136	34.0

Conclusion

It would appear, from this study, that in analogy test situations in which there is a choice between relations to educe, some relations are preferred over others. In this study, the relations Cause-Effect, Opposite, Conversion/Process, and Intrinsic-Functional tended to be preferred over Similarity/Equivalence, Class-Member, Extrinsic-Functional and Order/Time. There is some suggestion from the data that a hierarchy of preference for relations exists. However, definitive evidence for such a hierarchy will require a complete paired-comparisons matrix, which was not possible to achieve for this study. Nevertheless, the data from this study are not incompatible with a hierarchy hypothesis, and indeed lend support and warrant to further investigation of the hypothesis.

Reference

Soriano, L. V., Dawis, R. V., & Siojo, L. T. Relation eduction index norms for 1,000 word pairs and 8 relations: College sample. Technical Report No. 4, February, 1974, University of Minnesota. Contract Number N00014-67-A-0113-0030, Office of Naval Research.

APPENDIX

Biographical Information Sheet

Relation Recognition Exercise, Form A

Relation Recognition Exercise, Form B

BIOGRAPHICAL INFORMATION

1. School

2. Grade _____

3. Sex

1. Male
2. Female

4. Age at last birthday _____

5. Race:

1. Afro-American (Negro)
2. Mexican-American (Chicano)
3. American-Indian
4. Oriental-American
5. White
6. Other

6. Number of children in family:

1. 1 to 3
2. 4 to 6
3. 7 to 9
4. 10 or more

7. Annual family income:

1. less than \$5,000
2. \$5,000 - \$10,000
3. \$10,001 - \$15,000
4. \$15,001 - \$20,000
5. more than \$20,000

8. Which of the following is true of your family?

1. Owns the house in which you live
2. Rents the house in which you live
3. Rents an apartment unit
4. Lives in a public housing project

9. Which is true of your father's education?

1. Finished eighth grade or less
2. Went to high school but did not graduate
3. Finished high school but did not go to college
4. Went to college but did not get a degree
5. Graduated with a bachelor's degree or its equivalent
6. Did college study beyond the bachelor's level
7. If other, please specify

10. Which is true of your education?

1. Finished eighth grade or less
2. Went to high school but did not graduate
3. Finished high school but did not go to college
4. Went to college but did not get a degree
5. Graduated with a bachelor's degree or its equivalent
6. Did college study beyond the bachelor's level
7. If other, please specify

11. In which of the following categories does your father's main occupation belong? Examples of job titles within a category are shown in parenthesis.

1. Professional, technical, and managerial occupations (lawyers, doctors, teachers, engineers, writers and managers)
2. Clerical and sales occupations (typists, stenographers, salesmen and merchants)
3. Service occupations (domestic servants, barbers, protective servants, and waiters)
4. Farming, fishery, forestry, and related occupations (farmers, foresters, hunters and fishermen)
5. Processing occupations (processors of chemicals, wood, metal, food and tobacco)
6. Machine trades occupation (machinists, printers and textile workers)
7. Bench work occupation (fabricators, assemblers, repairmen)
8. Structural work occupations (metal fabricators, welders, and construction workers)
9. Miscellaneous occupations (truck drivers, packers, loggers and graphic artists)

12. In which of the following categories does your mother's main occupation belong? Example of job titles within a category are shown in parenthesis.

1. Professional, technical, and managerial occupations (lawyers, doctors, teachers, engineers, writers and managers)
2. Clerical and sales occupations (typists, stenographers, salespersons and merchants)
3. Service occupations (domestic servants, barbers, protective servants, and waiters)
4. Farming, fishery, forestry, and related occupations (farmers, foresters, hunters and fishermen)
5. Processing occupations (processors of chemicals, wood, metal, food and tobacco)
6. Machine trades occupations (machinists, printers and textile workers)
7. Bench work occupation (fabricators, assemblers, repair persons)
8. Structural work occupations (metal fabricators, welders, and construction workers)
9. Miscellaneous occupations (truck drivers, packers, loggers and graphic artists)
10. Housewife

University of Minnesota
Department of Psychology

Relation Recognition Exercise

Form A

Spring, 1974

Instructions

This exercise contains 68 items. For each item, the numbered word-pair is followed by two lettered word-pairs, a and b. Look at these two lettered word-pairs and choose the one that best represents the same relation found in the numbered word pair. Circle the letter of the word-pair you chose. Here is an example:

1. Light : Dark
 - a. Book : Chapter
 - b. Peace : War

The correct answer is b, because Light and Dark are opposites and Peace and War are opposites. You would thus circle the b.

You may now proceed with the exercises below. Try to answer all of the items, but do not spend too much time on any one.

- | | |
|--|---|
| 1. Cash : Money <ol style="list-style-type: none">a. Imitate : Copyb. Bullet : Arrow | 4. Orchard : Grove <ol style="list-style-type: none">a. Gun : Lanceb. Dismal : Dark |
| 2. Motor : Car <ol style="list-style-type: none">a. Food : Bodyb. Coconut : Palm Tree | 5. Foot : Shoe <ol style="list-style-type: none">a. Planet : Earthb. Cigarette Butt : Ash Tray |
| 3. Problem : Remedy <ol style="list-style-type: none">a. Rank : Militaryb. Vote : Elect | 6. Letter : Stamp <ol style="list-style-type: none">a. Floor : Walkb. Orange : Section |

- | | |
|--------------------------|-------------------------|
| 7. Daybreak : Sunset | 15. Garbage : Trash Can |
| a. Spring : Summer | a. Spoon : Soup |
| b. Iron : Rust | b. Angels : Heaven |
| 8. Egg : Bird | 16. Colt : Horse |
| a. Metal : Bullet | a. Today : Yesterday |
| b. April : September | b. Door : Car |
| 9. Negotiation : Treaty | 17. Mean : Average |
| a. Sand : Glass | a. Box : Jar |
| b. Hunger : Eat | b. Miss : Lass |
| 10. Cube : Block | 18. Grass : Seed |
| a. Dismal : Dark | a. Wheat : Chaff |
| b. Tomato : Carrot | b. Metal : Bullet |
| 11. Bran : Wheat | 19. River : Loom |
| a. Tomato : Carrot | a. Dull : Elunt |
| b. Butter : Milk | b. Harbor : Refuge |
| 12. Ink : Pen | 20. Faith : Trust |
| a. Scales : Fish | a. Ski : Bobsled |
| b. Gasoline : Automobile | b. Miss : Lass |
| 13. Root : Stem | 21. Boil : Steam |
| a. April : September | a. Work : Wages |
| b. Eye : Hand | b. Sunrise : Evening |
| 14. Summer : Winter | 22. Cone : Pine |
| a. Sunrise : Evening | a. Metal : Bullet |
| b. Buy : Sell | b. Water : Pool |

23. Winter : Summer
a. Success : Failure
b. Monday : Tuesday
24. Bud : Flower
a. Legs : Chair
b. Autumn : Winter
25. Wax : Candles
a. Lumber : Arrow
b. Furniture : Sofa
26. Herd : Pack
a. Automobile : Wagon
b. Imitate : Copy
27. League : Union
a. Check : Coins
b. Imitate : Copy
28. Rope : Fiber
a. Butter : Milk
b. League : Team
29. Boss : Leader
a. Miss : Lass
b. Shoelace : Button
30. Court : Tennis
a. Water : Fish
b. Hatch : Ship
31. Chicken : Egg
a. Sand : Glass
b. Rat : Pets
32. Rain : Flood
a. Kin : Cousin
b. Poison : Death
33. Wound : Scar
a. Lion : Animal
b. December : January
34. Past : Present
a. Hero : Villain
b. Kid : Goat
35. Fable : Legend
a. Cannon : Rifle
b. Add : Increase
36. Hurl : Throw
a. Gloom : Melancholic
b. Military Handshake : Handshake
37. Steer : Cattle
a. Ship : Fleet
b. Latter : After
38. Birth : Death
a. Seed : Pumpkin
b. Top : Bottom

39. Sled : Runner
a. Painter : Canvas
b. December : Christmas
40. Begin : End
a. Deny : Admit
b. Sunrise : Evening
41. Grape : Wine
a. Lumber : Arrow
b. Music : Hymn
42. Essential : Necessary
a. Horse : Mule
b. Subtract : Reduce
43. Day : Night
a. Calf : Cow
b. Frown : Smile
44. Milk : Cheese
a. Oyster : Pearl
b. Iron : Rust
45. Sea : Wave
a. Grove : Tree
b. Scene : Artist
46. Dwelling : Cottage
a. Paw : Claw
b. Bowl : Plate
47. Walnut : Walnut Tree
a. Hunger : Eat
b. Peninsula : Land
48. Raisin : Grape
a. Lumber : Arrow
b. Hospital : Institution
49. Title : Book
a. Fish : Fisherman
b. City : Kingdom
50. Skin : Body
a. Wednesday : Week
b. Garage : Car
51. Hammer : Anvil
a. Army Tank : Racing Car
b. Pick : Violin
52. Hide : Leather
a. Iron : Rust
b. Arm : Elbow
53. Ring : Hoop
a. Nest : Den
b. Subtract : Reduce
54. Fool : Idiot
a. Abide : Stay
b. Lettuce : Cabbage

55. Boy : Child
a. Bacon : Ham
b. Finger : Hand
56. River : Brook
a. Tablespoon : Teaspoon
b. Oyster : Pearl
57. Wound : Pain
a. Vote : Elect
b. Success : Joy
58. Grade : Rank
a. Hourglass : Pocket Watch
b. Establish : Begin
59. Steel : Ore
a. Eye : Needle
b. Butter : Milk
60. Stack : Layer
a. Sire : Father
b. Bar : Block
61. Heat : Steam
a. Sheep : Woolen Blanket
b. Golf : Club
62. Famine : Hunger
a. Battleship : Canoe
b. Cut : Bleed
63. Door : Hinge
a. Flower : Bee
b. Animal : Elephant
64. Bean : Coffee
a. Sand : Glass
b. Second : Minute
65. Lord : Peasant
a. Umbrella : Man
b. Land : Sea
66. Infection : Fever
a. War : Sorrow
b. Autumn : Winter
67. Dog : Hound
a. December : Christmas
b. Subtract : Reduce
68. Notion : Idea
a. Mow : Shave
b. Add : Increase

University of Minnesota
Department of Psychology

Relation Recognition Exercise

Form B

Spring, 1974

Instructions

This exercise contains 68 items. For each item, the numbered word-pair is followed by two lettered word-pairs, a and b. Look at these two lettered word-pairs and choose the one that best represents the same relation found in the numbered word pair. Circle the letter of the word-pair you chose. Here is an example:

1. Light : Dark
a. Book : Chapter
b. Peace : War

The correct answer is b, because Light and Dark are opposites and Peace and War are opposites. You would thus circle the b.

You may now proceed with the exercises below. Try to answer all of the items, but do not spend too much time on any one.

- | | |
|-------------------------|---------------------|
| 1. Bran : Wheat | 4. Orchard : Grove |
| a. Butter : Milk | a. Dismal : Luck |
| b. Tomato : Carrot | b. Gun : Lance |
| 2. Winter : Summer | 5. Letter : Stamp |
| a. Monday : Tuesday | a. Orange : Section |
| b. Success : Failure | b. Floor : Walk |
| 3. Dog : Hound | 6. Past : Present |
| a. Subtract : Reduce | a. Kid : Goat |
| b. December : Christmas | b. Hero : Villain |

7. Lord : Peasant
 - a. Land : Sea
 - b. Umbrella : Man
8. Grass : Seed
 - a. Metal : Bullet
 - b. Wheat : Chaff
9. Hammer : Anvil
 - a. Pick : Violin
 - b. Army Tank : Racing Car
10. Motor : Car
 - a. Coconut : Palm Tree
 - b. Food : Body
11. Negotiation : Treaty
 - a. Hunger : Eat
 - b. Sand : Glass
12. Steel : Ore
 - a. Butter : Milk
 - b. Eye : Needle
13. Hide : Leather
 - a. Arm : Elbow
 - b. Iron : Rust
14. Day : Night
 - a. Frown : Smile
 - b. Calf : Cow
15. Rain : Flood
 - a. Poison : Death
 - b. Kin : Cousin
16. Milk : Cheese
 - a. Iron : Rust
 - b. Oyster : Pearl
17. Cone : Pine
 - a. Water : Pool
 - b. Metal : Bullet
18. Cash : Money
 - a. Bullet : Arrow
 - b. Imitate : Copy
19. Title : Book
 - a. City : Kingdom
 - b. Fish : Fisherman
20. Garbage : Trash Can
 - a. Angels : Heaven
 - b. Spoon : Soup
21. Hurl : Throw
 - a. Military Handshake : Handshake
 - b. Gloom : Melancholic
22. Heat : Steam
 - a. Golf : Club
 - b. Sheep : Woolen Blanket

23. Summer : Winter
a. Buy : Sell
b. Sunrise : Evening
24. Ring : Hoop
a. Subtract : Reduce
b. Nest : Den
25. Daybreak : Sunset
a. Iron : Rust
b. Spring : Summer
26. Famine : Hunger
a. Cut : Bleed
b. Battleship : Canoe
27. Essential : Necessary
a. Subtract : Reduce
b. Horse : Mule
28. Boil : Steam
a. Sunrise : Evening
b. Work : Wages
29. Rope : Fiber
a. League : Team
b. Butter : Milk
30. Wound : Scar
a. December : January
b. Lion : Animal
31. Wax : Candles
a. Furniture : Sofa
b. Lumber : Arrow
32. Sled : Runner
a. December : Christmas
b. Painter : Canvas
33. Door : Hinge
a. Animal : Elephant
b. Flower : Bee
34. Chicken : Egg
a. Rat : Pets
b. Sand : Glass
35. Notion : Idea
a. Add : Increase
b. Mow : Shave
36. Herd : Pack
a. Imitate : Copy
b. Automobile : Wagon
37. Sea : Wave
a. Scene : Artist
b. Grove : Tree
38. Cube : Block
a. Tomato : Carrot
b. Dismal : Dark

(4)

FORM B

39. Grape : Wine
a. Music : Hymn
b. Lumber : Arrow
40. Walnut : Walnut Tree
a. Peninsula : Land
b. Hunger : Eat
41. Bean : Coffee
a. Second : Minute
b. Sand : Glass
42. Begin : End
a. Sunrise : Evening
b. Deny : Admit
43. Stack : Layer
a. Bar : Block
b. Sire : Father
44. River : Brook
a. Oyster : Pearl
b. Tablespoon : Teaspoon
45. Root : Stem
a. Eye : Hand
b. April : September
46. Boy : Child
a. Finger : Hand
b. Bacon : Ham
47. Bud : Flower
a. Autumn : Winter
b. Legs : Chair
48. Faith : Trust
a. Miss : Lass
b. Ski : Bobsled
49. Fool : Idiot
a. Lettuce : Cabbage
b. Abide : Stay
50. Birth : Death
a. Top : Bottom
b. Seed : Pumpkin
51. Boss : Leader
a. Shoelace : Button
b. Miss : Lass
52. Infection : Fever
a. Autumn : Winter
b. War : Sorrow
53. Wound : Pain
a. Success : Joy
b. Vote : Elect
54. Foot : Shoe
a. Cigarette Butt : Ash Tray
b. Planet : Earth

55. Hover : Loom
a. Harbor : Refuge
b. Dull : Blunt
56. Mean : Average
a. Miss : Lass
b. Box : Jar
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a. Establish : Begin
b. Hourglass : Pocket Watch
58. Skin : Body
a. Garage : Car
b. Wednesday : Week
59. Egg : Bird
a. April : September
b. Metal : Bullet
60. Ink : Pen
a. Gasoline : Automobile
b. Scales : Fish
61. Raisin : Grape
a. Hospital : Institution
b. Lumber : Arrow
62. Problem : Ready
a. Vote : Elect
b. Rank : Military
63. Dwelling : Cottage
a. Bowl : Plate
b. Paw : Claw
64. League : Union
a. Imitate : Copy
b. Check : Coins
65. Fable : Legend
a. Add : Increase
b. Cannon : Rifle
66. Steer : Cattle
a. Latter : After
b. Ship : Fleet
67. Court : Tennis
a. Hatch : Ship
b. Water : Fish
68. Colt : Horse
a. Door : Car
b. Today : Yesterday

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